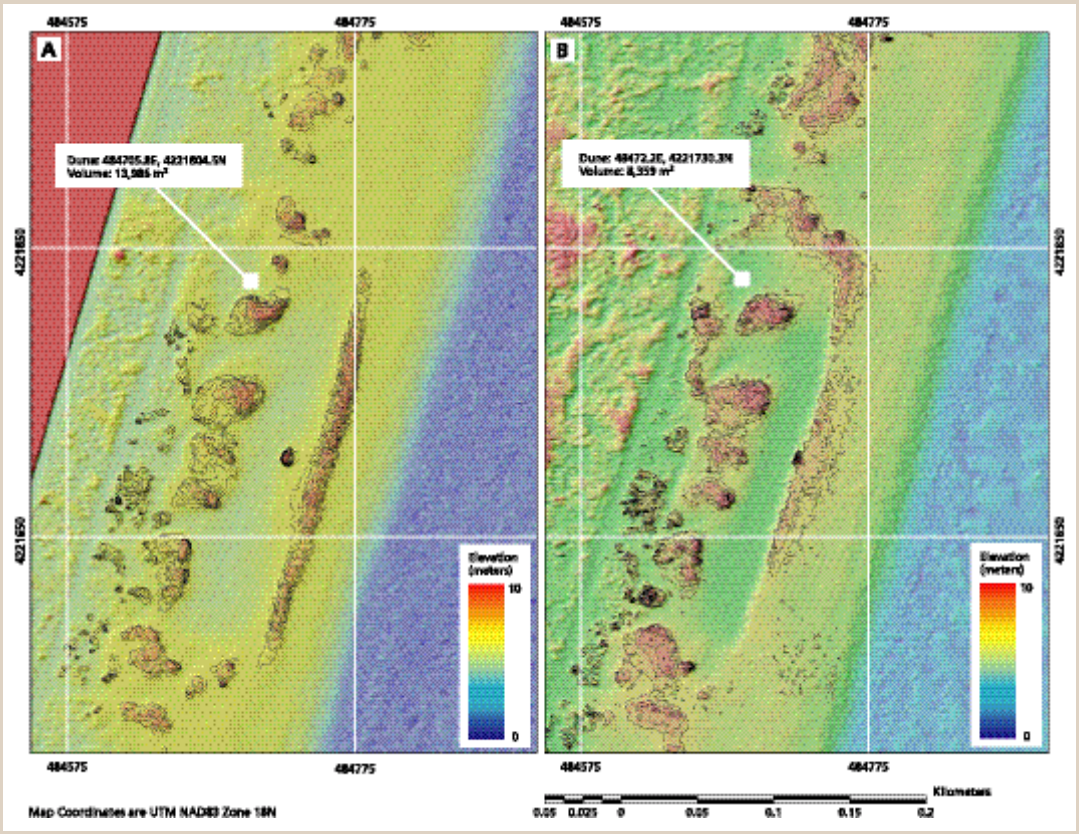
"Flooding … parks with commissioned rangers will not do the job. In the long run, we will win by showing that we have learned how these ecosystems function."

Boyd Evison, Memo to NPS Director, 1989

Building on the Challenge



MAP: U.S. GEOLOGICAL SURVEY, MELAINE HARRIS. ELEVATION DATA: NASA

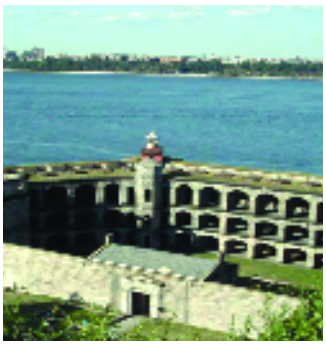
A barrier island dune at Assateague Island National Seashore has moved southwest and decreased in volume, as revealed in this pair of maps developed from lidar elevation data collected on 3 April 1998 (left) and 5 September 2001 (right). The Northeast Coastal and Barrier Network is collaborating with several science partners to develop a protocol for monitoring shoreline change at many of the network parks that combines lidar and conventional mapping techniques.

In 2002 the National Park Service continued to build the capacity for effective management of the irreplaceable landscapes and living things in national parks through the Natural Resource Challenge. Now in its fourth year, the Challenge is a multiyear effort to improve resource preservation throughout the National Park System by developing a better understanding of park natural resources and implementing fundamental and innovative resource management programs. With the President's FY 2003 budget, Congress will have made available $67.5 million, or two-thirds, of the $100 million in additional annual funding needed to realize the goals established under the Natural Resource Challenge. Articles in this chapter and throughout this report examine the progress under the Challenge in 2002. In particular, inventory and monitoring networks continued their evolution, with five new networks being established in 52 parks to track key physical and biological resources. The information developed will be used to assess resource condition, a critical need in the parks. Seventeen of 32 planned networks will be operational with FY 2003 funding; the other 15 networks are identified as needs in the remaining portion of the Challenge. Altogether, the articles demonstrate the tremendous contribution of the Natural Resource Challenge to National Park Service successes in 2002.

Monitoring on the North Atlantic Coast: An example of successful collaboration

by Bryan Milstead, Sara Stevens, and Betsie Blumberg

NPS PHOTO BY BRYAN MILSTEAD



Part of the Staten Island unit of Gateway National Recreation Area, Fort Wadsworth juxtaposes cultural and natural resources with one of the world's largest metropolitan areas—New York City. Resource monitoring provides an opportunity to study urban ecology, advance conservation, and raise the awareness of park resources and values.

IN THE NORTHEAST, THREE DISTINCT ENTITIES are working together to meet the goals of the Natural Resource Challenge to monitor vital signs in national parks: the Cape Cod National Seashore Prototype Program, the Northeast Coastal and Barrier Network, and the North Atlantic Cooperative Ecosystem Studies Unit (CESU). Vital signs are specific indicators of natural processes that can be monitored over time to reveal changes in ecosystem health, providing critical information for management decisions. In addition, network monitoring protocols are being adapted for use in national wildlife refuges along the Northeast Coast.

Cape Cod National Seashore, Massachusetts, is a prototype for Atlantic and Gulf Coast parks, funded since 1996 to develop a long-term ecological monitoring program in partnership with the USGS Biological Resources Division. Guiding its monitoring is a simple but effective framework that has been adopted by the network. The framework describes representative park ecosystems and creates a conceptual model for each. The models are used to understand ecosystem responses to natural and human-related disturbance and to identify candidate variables for vital signs monitoring.

"Assateague Island National Seashore has been cooperating with NASA in using ... an airborne laser technique to derive elevation data for shoreline study."

The Northeast Coastal and Barrier Network comprises eight parks: Assateague Island, Cape Cod, and Fire Island National Seashores; Colonial National Historical Park; Gateway National Recreation Area; George Washington's Birthplace National Monument; and Sagamore Hill and Thomas Stone National Historic Sites. The network was funded in 2000 and its staff are colocated at the University of Rhode Island with the North Atlantic Cooperative Ecosystem Studies Unit, established in 1999.

The parks in this network occupy an ecosystem constantly experiencing landform changes due to natural factors such as storms, or due to human activity. As a result, monitoring shoreline change is critical. Since 1995, Assateague Island National Seashore has been cooperating with NASA in using lidar (an airborne laser technique) to derive elevation data for shoreline study. The USGS Coastal and Marine Geology Center joined the partnership in 1998, and has been developing applications for park use of these data. At the same time, Cape Cod was cooperating with the USGS Biological Resources Division to develop a shoreline change monitoring protocol.

Following the lead of Assateague and Cape Cod, the network has borrowed Assateague staff to work with network parks and with scientists from the USGS, U.S. Army Corps of Engineers, Virginia Institute of Marine Sciences, and Woods Hole Oceanographic Institute to develop a model of shoreline change and recommend procedures for long-term measurement. Beach geomorphology will be monitored twice a year by traditional mapping techniques and every other year with lidar technology.

Coastal parks play an important role in protecting wetlands along the Atlantic Coast. In collaboration with the USGS, Cape Cod has produced monitoring protocols for salt marshes. Dr. Charles Roman, who now heads the North Atlantic CESU, led the development of these protocols as a USGS scientist. The CESU and Cape Cod are now assisting the network with development of salt marsh monitoring protocols. Complementary protocols for monitoring nutrient enrichment of estuaries are being developed by the network in cooperation with the USGS and academic partners.

Some of Cape Cod's protocols are being implemented in U.S. Fish and Wildlife Service refuges along the coast. Outreach is an important part of the mission at Cape Cod and the network; achievements and insights are continually shared with parks, networks, and agencies through workshops, presentations, and the Web. This broad alliance of NPS groups is making great progress toward the realization of the goals of the Natural Resource Challenge. ■

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National Capital Region Network: A milestone in the making

by Sybil Hood

"The network has been successful in ... pooling the limited resources of its 11 parks."

THE NATIONAL PARK SERVICE'S INVENTORY and Monitoring Program is a titanic effort to develop critical information about the natural resources found within 270 parks organized into 32 monitoring networks. The National Capital Region Network is one of the first networks to receive funding to develop a comprehensive long-term monitoring plan. In 2002 the National Capital Region Network reached some key milestones and emerged as a model for how monitoring networks were envisioned to function. The network has been successful in developing partnerships with other scientific entities to undertake inventory and monitoring activities and pooling the limited resources of its 11 parks, many of which are relatively small, with limited staff and resources devoted to natural resources.

One of the year's most important accomplishments occurred in July 2002 when the National Capital Region Network hosted a three-day monitoring workshop that was designed to further engage the scientific community. The workshop attracted more than 100 participants, representing some 28 agencies and organizations, 14 national parks, and five NPS divisions and regions. Technical input was gathered on the region's most important resources, including air, water, geology, landscape, vegetation, wildlife, invertebrates, and threatened and endangered species. Participants prioritized the threats to these resources and identified potential vital signs to monitor ecosystem health. The information gathered during the workshop will feed into the planning process and the development of the network's monitoring plan. Technical committees will continue to meet and build upon the momentum created by the workshop.

NPS PHOTO BY JOHN SINCLAIR

An inventory of the fish communities within six parks of the National Capital Region Network was implemented in 2002 by the network's Inventory and Monitoring Program. Using the Chesapeake Watershed Cooperative Ecosystem Studies Unit, the National Park Service established a partnership with Dr. Richard Raesly of Frostburg State University, who surveyed habitats along the Chesapeake and Ohio Canal National Historical Park.

Biological inventories of vertebrate species and vascular plants continued in 2002. The network coordinates the field research for these surveys, which are awarded primarily to partnering agencies, universities, Cooperative Ecosystem Studies Units, and private contractors through competitive contracts. Bird inventories using volunteers are the exception to this model. Initiated by the National Capital Region Network, this highly successful volunteer effort provides valuable information to the parks at no cost, promotes park appreciation, and develops community support for the Inventory and Monitoring Program (see page 21).

Begun in 2001, the monitoring portion of the effort also posted progress in 2002 on the seven-step implementation plan recommended by the national Inventory and Monitoring Program. The National Capital Region Network began the process by summarizing existing information on important resources, resource threats, management issues, current and historical monitoring, and monitoring needs in the parks. A science advisory committee—composed of a resource manager from each park, regional NPS staff, and scientists from partnering agencies—was formed to provide technical input for the development of the network's monitoring plan. Experts affiliated with other state and federal government agencies, universities, and conservation groups were invited to many of the committee's meetings to provide additional technical expertise on an ad hoc basis.

An important part of the National Capital Region Network's 2003 agenda includes enhancing understanding of and support for the Inventory and Monitoring Program. Network staff plan to participate in meetings related to conservation in the region, create fact sheets and newsletters, and meet with park staff who have regular contact with park visitors. Work will continue on inventory efforts and the development of the monitoring plan. In 2003 the National Capital Region Network looks forward to forging new partnerships and building upon the cooperative efforts that flourished in 2002. ■

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The cornerstone of natural resource stewardship: Vital signs monitoring

by Steve Fancy

IN 2002, AS A MAJOR COMPONENT OF THE NATURAL Resource Challenge, 12 "vital signs" monitoring networks encompassing 101 parks made considerable progress with the difficult task of developing an integrated natural resource monitoring program. Another 5 networks (for 52 parks) received planning funds. Together, these 17 networks are designing a system for natural resource data collection, analysis, and reporting that is unprecedented in the history of the National Park Service.

Natural resource monitoring identifies and tracks "the most significant indicators of ecological condition and the greatest concerns of each park," known as vital signs, to provide park managers with the broad-based, scientifically sound information they need to effectively manage park resources. Monitoring focuses on the natural resources that park managers are directed to preserve "unimpaired for future generations," including water, air, geologic resources, plants and animals, and the various ecological, biological, and physical processes that created the parks and continue to act upon them.

Why is the vital signs monitoring program so important to the protection of natural resources for future generations? Simply put, monitoring provides a basis for understanding and identifying meaningful change in natural systems characterized by complexity, variability, and surprises. Knowledge and understanding result in better management decisions and allow park managers to work more successfully with the public and other agencies to protect park resources. Additionally, the credible scientific information that results from monitoring can help to resolve contentious and difficult resource issues. For example, the challenge of sustaining a natural system is even more complicated when natural areas have been so highly altered that physical and biological processes no longer operate (e.g., control of fires and floods in developed areas). In these situations, monitoring can help managers understand how to develop the most effective approach to restoration.

"Vital signs monitoring is an ongoing effort with many partners to better understand how to sustain and restore park natural systems … before irreversible loss can occur."

Hawksbill turtles at Buck Island Reef National Monument in the Caribbean Sea have benefited from the efficient and cost-effective methods developed by the Virgin Islands/South Florida prototype network for monitoring and restoring sea turtle populations. In 2002, an interagency team of scientists reviewed the network's program and commended the park staff on their success.

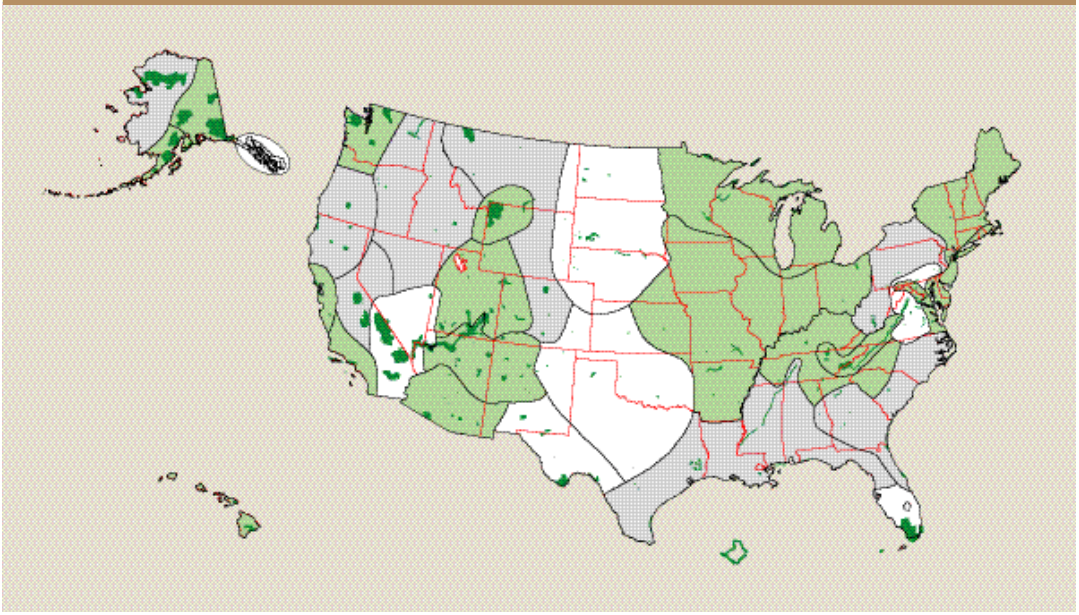
And why is the task of developing an integrated, multipark, and interagency monitoring program so challenging? Our understanding of ecological systems and the concepts of sustainability and integrity of natural systems has evolved: the classic view of the "balance of nature" has been replaced by a nonequilibrium paradigm. The new model recognizes that ecological systems are regularly subject to natural disturbances—such as droughts, floods, and fires—that alter the composition and structure of these systems and the processes that shape them. In addition, no single spatial or temporal scale is appropriate for all of the ecosystem components and processes. Depending on the resource, the appropriate scale for its understanding and effective management might be at the population, species, community, or landscape level. Not only are natural systems complex and ever changing, but parks are open systems. For example, threats such as invasive species and air and water pollution come from outside park boundaries. The scope and scale of many other threats and solutions also extend beyond park boundaries, requiring a multiagency, ecosystem approach to understand and manage these natural systems.

The overall strategy for implementing long-term ecological monitoring in approximately 270 parks with significant natural resources involves two components: 11 experimental or "prototype" monitoring programs begun in 1992, and 32 vital signs monitoring networks of parks linked by

Legend

- Monitoring networks funded in FY 2001–2003 for core park vital signs and water quality monitoring
- Monitoring neworks proposed for funding in FY 2004 for core park vital signs and water quality monitoring
- Monitoring networks that will not be funded as of FY 2005

PARK VITAL SIGNS MONITORING NETWORKS



NPS MAP BY NATURAL RESOURCE INFORMATION DIVISION

geography and shared natural resource characteristics. Parks within each of the 32 networks will work together and share funding and professional staff to plan, design, and implement an integrated, long-term monitoring program. Currently, 17 of the 32 monitoring networks are under way, and the remaining 15 networks await funding to make this important management tool available to the entire National Park System.

The complicated task of developing a network monitoring program requires an initial investment in planning and design to guarantee that monitoring meets the most critical information needs of each park and produces scientifically credible data that are readily accessible to managers and researchers. These front-end investments also ensure that monitoring will build upon existing information and understanding of park ecosystems and make maximum use of leveraging and partnerships with other agencies and academia.

At the end of FY 2002, the first 12 networks had completed Phase 1 of the three-phase planning and design process. The Phase 1 report developed by each network includes the results of summarizing existing data; defining goals and objectives; beginning the process of identifying, evaluating, and synthesizing existing data; developing draft conceptual models; and completing other background work that must be done before the initial selection of vital signs. The Phase 1 reports are peer reviewed and approved at the regional level before the network proceeds to the next phase. Phase 2 involves a series of meetings and scoping workshops to prioritize and select the indicators that will be included in the network's initial integrated monitoring program. Phase 3 entails the detailed design work needed to implement monitoring, including the development of sampling protocols, a statistical sampling design, a plan for data management and analysis, and details on the type and contents of various products of the monitoring effort, such as reports and websites.

During the past two years, park networks involved in the planning and design of monitoring programs have received assistance from numerous federal and state agencies, nongovernmental organizations such as NatureServe, private contractors, Cooperative Ecosystem Studies Units, and academic scientists from more than 100 universities. The efforts of these entities to develop an integrated, systems-based monitoring program have catalyzed the development of a number of interagency partnerships. Today, vital signs monitoring is an ongoing effort with many partners to better understand how to sustain and restore park natural systems, and it serves as an early-warning system to detect declines in ecosystem integrity and species viability before irreversible loss can occur. The vital signs monitoring networks are a central component of natural resource stewardship as the National Park Service embraces the concepts of "parks for science" and "science for parks." ■

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New aquatic resource professionals stationed in parks

by Dan B. Kimball

IN FY 2002 THE NATIONAL PARK SERVICE HIRED nine new field-based aquatic resource professionals to address a variety of critical needs. These new staff members are providing technical assistance to parks, identifying and conducting technical investigations to determine the condition of park aquatic resources, and determining if actions of the National Park Service or external parties impair or impact resources. They also are developing and implementing aquatic resource mitigation and restoration projects and interpreting and implementing NPS water resource–related policies and regulations. Of the 13 professional aquatic resource positions funded in FY 2002, 4 remain to be filled.

"These new staff members are … conducting … investigations to determine the condition of park aquatic resources and … implementing aquatic resource mitigation and restoration projects."

In deciding which aquatic resource disciplines would be required and where the new staff would be stationed, the National Park Service evaluated existing water resource–related issues and needs and the distribution of aquatic resource professionals in the parks. Based on this evaluation, the 13 newly funded positions include four fisheries biologists at Lake Clark National Park and Preserve (Alaska), Northern and Southern Colorado Plateau Networks, Chattahoochee River National Recreation Area (Georgia), and Isle Royale National Park (Michigan); four aquatic ecologists at Yukon-Charley Rivers National Preserve (Alaska), Point Reyes National Seashore (California), Saint Croix National Scenic Riverway (Wisconsin and Minnesota), and Center for Urban Ecology (National Capital Region); two hydrologists at Delaware Gap National Recreation Area (Pennsylvania and New Jersey) and Grand Teton National Park (Wyoming); a groundwater hydrologist at Sonoran Desert Network; a geomorphologist at Mount Rainier National Park (Washington); and a wetlands ecologist at Chattahoochee River.

These new staff members work on a wide range of water resource–related issues facing the parks. Some particularly significant issues to be addressed include the recovery of endangered fish (e.g., in the Colorado River), evaluating the water quality impacts of urban development (e.g., near Delaware Water Gap), assessing stream stabilization and the protection of cultural resources (e.g., Klondike Gold Rush National Historical Park, Alaska), analyzing the effects of beach replenishment projects (e.g., Fire Island National Seashore, New York), evaluating groundwater development near parks (e.g., Saguaro National Park, Arizona), and the reestablishment of anadromous fish populations in park waters (e.g., Point Reyes).

The Natural Resource Challenge calls for funding and placement of 16 new aquatic resource professionals in the parks by FY 2003. Funding for the final three positions is expected in FY 2003 and would provide two groundwater hydrologists at Chickasaw (Oklahoma) and Lake Mead National Recreation Areas (Nevada) and a marine ecologist at Fire Island.

Prior to funding provided by the Natural Resource Challenge, only 20 parks had aquatic resource professionals on staff. Founders of the Challenge recognized the need to increase professional expertise and to employ more park-based aquatic resource professionals to address water resource–related issues facing the National Park System. Consistent with the goals of the Challenge, these new positions will significantly enhance the National Park Service's capability to understand, maintain, restore, and protect aquatic resources in the national parks. ■

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NPS PHOTO

Hydrologists sample water quality in Lake Powell, Glen Canyon National Recreation Area, Utah. The Natural Resource Challenge funded a fishery biologist and water resource specialist to deal with natural resource projects and fishery issues in national parks in the Colorado River watershed.

Air quality monitoring capabilities improve thanks to Challenge

by Mark Scruggs

"The Challenge … facilitated new monitoring … of mercury and toxic organic pollutants and new ecological effects studies."

THE AIR RESOURCES DIVISION OPERATES a network of ambient air quality monitoring sites in many units of the National Park System. The parameters measured include ozone, dry deposition (gases and particles), wet deposition (precipitation chemistry), visibility, and particulate matter. The multiyear Natural Resource Challenge called for expanding the network to improve geographical representation, with emphasis on parks most threatened by air pollution or most vulnerable to air pollution degradation. As a result, the National Park Service began new monitoring in FY 2002 and is phasing in additional sites in FY 2003 and FY 2004. The expanded monitoring network now includes all parks classified under the Clean Air Act as Class I areas and a select number of Class II area parks.

EPA PHOTO BY DIXON LANDERS

The Natural Resource Challenge enabled the National Park Service in 2002 to begin surveying western U.S. national parks for toxic compounds in food webs. As part of the Western Airborne Contaminants Assessment Project (WACAP), NPS staff undertook a lake bathymetric assessment at Rocky Mountain National Park, Colorado.

The Challenge also facilitated new monitoring themes of mercury and toxic organic pollutants and new ecological effects studies. Ambient concentrations of mercury are usually low, but deposition of human-related sources of mercury into lakes and streams can trigger biological processes that chemically transform this element into a toxic form that can accumulate in fish and mammals. This occurrence can be harmful to the host and any organism that consumes it. The Air Resources Division initiated mercury sampling in four parks in FY 2002, with an additional site to be added in FY 2003, to determine the amount, extent, and seasonality of mercury deposition in national park ecosystems.

In 2002 the Air Resources Division initiated several projects addressing the ecological effects of air pollution in national parks. One study analyzes total deposition (cloud, fog, dry, and precipitation) patterns of pollutants such as nitrogen and sulfur, while another links ecosystems and nitrogen cycling models to estimate the threshold of nitrogen deposition when sensitive lakes become acidic. A third study examines ozone pollution damage to the growth and physiology of native trees and wildflowers. A related project correlates remote sensing of tree condition with field measurements of ozone concentration, tree condition, and soil moisture to develop large-scale predictive techniques for determining where forest stands will be at high risk for ozone injury.

The National Park Service is also concerned about risks to park food webs from airborne contaminants. Toxic airborne compounds pose serious health threats to wildlife and humans, affecting reproductive success, growth, behavior, disease, and survival. Consequently, the Air Resources Division initiated the Western Airborne Contaminants Assessment Project, a five-year program funded by the Challenge to inventory contaminants in western U.S. national parks and to develop scientific information on the exposure, accumulation, and impacts of toxic compounds in the food chain. Inventories of contaminants from snow, water, sediment, lichen, bark, and fish will be conducted in seven key parks in the West and Alaska. Contaminant concentrations in wild foods consumed by subsistence users will also be assessed in Alaska.

In addition to funding new monitoring and studies, the Natural Resource Challenge supported long-established air quality monitoring efforts in national parks and augmented data management, reporting, and interpretation. The National Park Service is now able to fill in data gaps in the existing monitoring network, expand the scope of air quality monitoring activities, and maintain sites, improving our understanding and interpretation of air pollution transport, concentrations, and effects. The Challenge funding also added to the professional expertise of the Air Resources Division to better serve local and regional resource management needs. This initiative enhances the opportunity for the National Park Service to engage fully and effectively in external arenas where decisions regarding pollution control programs are being made. ■

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Learning centers ignite interest and advance research in national parks

by Lynne Murdock

NPS PHOTO (ALL)

A joint venture between Kenai Fjords National Park and the Alaska SeaLife Center in Seward, the Ocean Alaska Science and Learning Center promotes research and educational opportunities related to the Alaskan coast and waters. As part of a learning center–sponsored conference on Alaskan ocean resources, students learned to use global positioning systems for beach mapping.

The Ocean Alaska Science and Learning Center is funding a productivity study of the black oystercatcher, a shorebird whose recovery since the 1989 *Exxon Valdez* oil spill in Kenai Fjords National Park is unknown.

IN 2002, NPS LEARNING CENTERS, A KEY COMPONENT of the Natural Resource Challenge, made tremendous progress in igniting the interest of the American public in the unsurpassed scientific and educational opportunities found in national parks. Learning centers have been designed as public-private partnerships that involve a wide spectrum of people and organizations in opportunities to better understand our natural world and to apply science in park management. The centers attract researchers not affiliated with the National Park Service to conduct research and make new information about park resources available to park managers and partners, the public, and neighboring communities. In 2002 eight new learning centers moved into various stages of development and the initial five learning centers continued to serve as field stations for collaborative research activities.

Collaboration and cooperation are the hallmarks of learning centers, serving to leverage the resources of the National Park Service and its partners. A shining example in 2002 is a joint effort between the National Park Service and the State of Maine to develop the Acadia Learning Center. The center will be sited on a 100-acre former Navy base acquired by the National Park Service on 1 July 2002. Through coordinated funding and planning, the base will be converted to suitable laboratory, classroom, office, and residential facilities.

Many of the learning centers are engaging students and volunteers in programs that provide hands-on opportunities to explore science; in most cases the efforts of students and volunteers also benefit the parks. For example, the North Coast and Cascades Learning Center, which is in its first year of operation, provided science programs for 16,400 children, teenagers, and adults in 2002. One of the center's projects helped North Cascades National Park team up with EarthCorps and Seattle Parks and Recreation to involve 200 students from inner-city Seattle in a project to control nonnative invasive plants. Through another educational partnership project, Cape Cod National Seashore's Atlantic Learning Center is partnering with NASA to develop an education program on remote sensing that involves both teachers and researchers. The program, funded by a grant from the National Park Foundation, will use existing remote sensing research to demonstrate remote sensing technology, enabling students and teachers to use these tools to interpret data collected locally.

Learning centers are well on the way to becoming leaders in education and outreach. The Pacific Coast Learning Center won awards from the National Association for Interpretation in 2002 for a curriculum guide, *Discovering the Northern Elephant Seals,* and for a redesigned website. The center also received a 2002 Department of the Interior Environmental Achievement Award for exceptional contributions in the area of education and outreach.

In 2002, learning centers also advanced groundbreaking research that benefits national parks. Researchers working in conjunction with the Appalachian Highlands Science Learning Center are addressing priority research needs at Great Smoky Mountains National Park, including the effects of ground-level ozone on native plant species; inventories of invertebrate, plant, and fungi species; and monitoring of songbird, salamander, and moth populations. Researchers and volunteers at Rocky Mountain National Park, working through the Continental Divide Research and Learning Center, also made significant contributions in 2002 (see page 14).

In addition to the 13 learning centers that are currently in operation, proposals for 17 more have been approved for establishment should funding become available in the future (see page 10). Each proposed center represents the possibility inherent in the Natural Resource Challenge to focus energy, commitment, and resources on better understanding our natural heritage. ■

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Initiated in FY 2002, the Old-growth Bottomland Forest Research and Education Center is hosted by Congaree Swamp National Monument, South Carolina. During the year the center facilitated research and educational activities, including a program to familiarize the public with fish species being investigated at the park.

Ecological integrity goals prompt expansion of Canadian national park system

by Carrie Ellen Gauthier

"Both park systems face the same threats from ecological stresses, nonnative species, fire, high levels of visitor use, habitat loss and fragmentation, … and climate change."

IN NOVEMBER 2002 THE CANADIAN GOVERNMENT announced plans to create 10 parks and 5 new marine conservation areas over the next five years. During this time Canada also plans to accelerate actions to improve the ecological integrity of its 39 existing national parks. The increase in parkland and efforts to improve ecological integrity will implement the action plan of the panel on Ecological Integrity of Canada's National Parks.

Canada's plan focuses on inventory and monitoring, science-based decision making, developing partnerships, education, and increasing public participation, and shares many of the same fundamental goals and approaches as the National Park Service's Natural Resource Challenge. Both action plans support parks as living laboratories and identify the need to provide funding to researchers, make research at parks more accessible, and enhance opportunities for science-based education in parks.

The NPS Associate Director of Natural Resource Stewardship and Science, Dr. Michael Soukup, gave the keynote address in November 2002 at a three-day ecological integrity forum launching Canada's action plan in Halifax, Nova Scotia. Soukup focused on the increased benefits that both park systems will share with the expansion of their inventory and monitoring, improvements in science-based decision making, and implementation of better management practices to preserve natural resources. He stressed the value of gathering information about species distribution, abundance, and trends, and air and water quality for sound management, decision making, and resource problem characterization.

Both park systems face the same threats from ecological stresses, nonnative species, fire, high levels of visitor use, habitat loss and fragmentation, air and water pollution, encroachment of urban and industrial development, and climate change.

Canada's new park sites will be located in British Columbia's Gulf Islands, at Ukkusiksalik and Bathurst Island in Nunavut, in Labrador's Torngat and Mealy Mountains, in Manitoba's lowland forests, and on the East Arm of Great Slave Lake in the Northwest Territories. Canada will also add national marine conservation areas in ecologically unrepresented marine regions. Three sites have been identified: Gwaii Haanas of British Columbia's Queen Charlotte Islands, Western Lake Superior, and British Columbia's Southern Strait of Georgia. Sites for the remaining two marine conservation areas have not been announced. ■

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Pender Island is part of a proposed national park in the Gulf of Georgia, British Columbia, about 10 miles north of the U.S. San Juan Island National Historical Park.

PARKS CANADA (ALL)

Adjacent to Hudson Bay in Nunavut, Canada's third and newest territory, Wager Bay is in the heart of the proposed Ukkusiksalik National Park and represents the central tundra natural region of Canada. The proposed park area is geographically diverse and encompasses habitats that support caribou, muskox, wolf, arctic hare, peregrine falcon, gyrfalcon, polar bear, beluga, and ringed and bearded seal.

Étagaulet River Falls in the proposed Mealey Mountains National Park, Labrador.

NPS PHOTO

Dan Boughter, Jim Bromberg, and Andy Wisdom of the California EPMT cut eucalyptus trees at Cabrillo National Monument, San Diego, and apply salt (instead of herbicide) to the stumps before covering them in black plastic.

Exotic plants diminish under EPMTs

by Linda Drees

In 2002 five new Exotic Plant Management Teams (EPMTs) controlled damaging invasive plants that threaten native species conserved in the national parks. In total, nine teams served more than 95 parks, treated more than 100 species of harmful invasive plants on 85,000 infested acres, monitored more than 41,000 acres, and restored 8 acres. Six species of invasive plants have been eradicated from parks since the establishment of EPMTs.

EPMTs were first formed in 2000 with funding from the Natural Resource Challenge. As mobile strike forces consisting of plant management specialists, EPMTs assist parks with urgent invasive plant control measures. The teams have increased their technical capacity through the recent development of a Web-based data system and a corresponding Geographic Information Systems map to track progress at each project site and to illustrate the link between monitoring and management. An annually updated EPMT operations handbook provides EPMTs and other partners with a framework for developing rapid response teams. The NPS EPMTs are proving so successful that the National Wildlife Refuge Association is requesting funding for 50 of its own teams for the Wildlife Refuge System.

Seven more teams were requested in FY 2003 to serve national parks in the following areas: Colorado Plateau, Northern Rockies, Great Lakes, Mid-Atlantic, Northeast, Appalachian Highlands and Cumberland Piedmont, and Alaska. As Natural Resource Challenge support of EPMTs has grown, exotic plants have diminished and park natural resources are being protected. ■

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Learning centers meeting most objectives

With 17 learning centers proposed for future establishment, the Secretary of the Interior asked the National Park Service in 2002 to evaluate operational centers before additional funding would be considered to expand the network. The analysis focused on the initial five learning centers and found them to have great potential for increasing partnerships, cooperation, and collaboration and for giving parks the information they need but may never have the staff or internal funding to obtain.

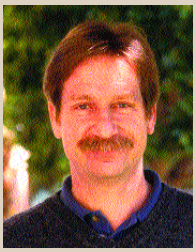
Several accomplishments highlight the early success of the learning centers. The centers are largely meeting their research-related objectives. Most have expanded facilities for researchers, including housing, and have increased the amount and quality of the research being conducted. They are becoming excellent venues to engage "citizen scientists" in research and have programs for informing the public about what is being learned about park resources. The Internet, intranet, science conferences, and school science curriculums are all proving to be valuable avenues for information dissemination. Many strong and diverse partnerships have been formed and are furthering the goals of the learning centers. One area needing improvement is the coordination of research and informational functions between a park that hosts a learning center and the other parks in its network. Other than the Ocean Alaska Science and Learning Center, which benefits all its member parks, the initial learning centers tend to focus on the host park and are just beginning to coordinate these functions with other parks. All in all, the initial learning centers are succeeding in facilitating research in national park networks in collaboration with partners, and are serving as a catalyst to share knowledge widely.

The report was transmitted to Secretary Norton in August and recommended that the waiting list of 17 learning centers be approved for FY 2003 funding. ■

AWARD-WINNER PROFILE

A champion for the Natural Resource Challenge

NPS PHOTO



Don Neubacher

Although he serves as superintendent of Point Reyes National Seashore in California, Don Neubacher is a champion for the preservation of natural resources throughout the National Park System. "I enjoy working on something that's a legacy for the nation; it's a public service that has long-lasting value and I'm pretty inspired by that." The leadership Don has demonstrated in pursuing the Natural Resource Challenge helped to earn him the 2002 Director's Award for Superintendent of the Year for Natural Resource Stewardship.

Don is a talented superintendent and has successfully managed several controversial issues during his career. He professionalized the staff of the national seashore, established lines of communication with the park's local and extended communities, and created closer ties among federal, state, and other agencies and nongovernmental organizations. His most notable achievement, however, has been five years in the making: Don helped envision and implement a major, national natural resource initiative, the Natural Resource Challenge. This program, which began in 2000, is designed to increase funding for the National Park System by $100 million annually and identifies numerous actions needed to improve the capabilities of the National Park Service to sustain park natural resources. Funding increases have already gone toward initiating nationwide natural resource inventories, establishing long-term monitoring programs, enhancing air and water quality, and creating Exotic Plant Management Teams, learning centers, and Cooperative Ecosystem Studies Units.

Don's role in pursuing this initiative has been crucial. He testified before Congress, met with the National Leadership Council and regional councils, and has educated NPS employees through presentations and literature that he and his staff developed. His energy and dedication to the Natural Resource Challenge are endless, and his leadership at Point Reyes and for this important national program is evident in the support he receives to help manage major projects. ■

AWARD-WINNER PROFILE

Changing the way the National Park Service does business

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Steve Fancy

Dr. Steven Fancy was honored in 2002 with the Professional Excellence in Natural Resources Award. He helped engineer the network concept for vital signs monitoring and was also the author of the NPS Monitoring Vision in 1999. Through his leadership and dedication, the concept of monitoring networks is becoming a reality. For Steve, it was about stepping up to the plate. "I saw a window of opportunity and I became a workaholic and did what was needed to get the program going. It took organizing, getting others involved, and establishing a vision; in the end, it got people to work together to move forward."

People did move forward and, in doing so, created a monitoring network that has essentially changed the way the National Park Service does business. It allows for data to be gathered by the parks, regions, and divisions, and makes information available to park resource managers and decision makers. The successful concept is about sharing rather than concentrating on individual projects. Steve realizes how his hard work is paying off. "The Inventory and Monitoring Program has become a unifying program. It brings people and parks together; while parks used to compete [with one another for funding and staff], now they are on the same side. It's an interdisciplinary approach to help parks work on things they have in common."

Steve has stepped into a leadership role and performed his duties with great skill. He works hard to get people to follow, and in turn, people work hard for him. ■